Execution of Flow Strategies aka “Go Button”

Randy L. McGuire

May 15, 2003

© 2003 The MITRE Corporation. All Rights Reserved.

Research Objective

- **Scope**
  - **TFM Rerouting Initiatives can be more effective through increased information sharing and capability integration**
    - **ETMS will have capability to identify flight-specific reroutes**
    - **Integration between ETMS and user and ATC capabilities:**
      - **Improves efficiencies in implementing rerouting strategy**
      - **Increases predictability of system in response to TFM initiatives**
- **Research Objective**
  - **Develop and validate concepts and requirements for integrating information between TFM, ATC, and NAS user capabilities in order to implement TFM reroutes**
- **"Go Button" is a term to describe how flight-specific reroutes can be integrated into ATM and User automation**

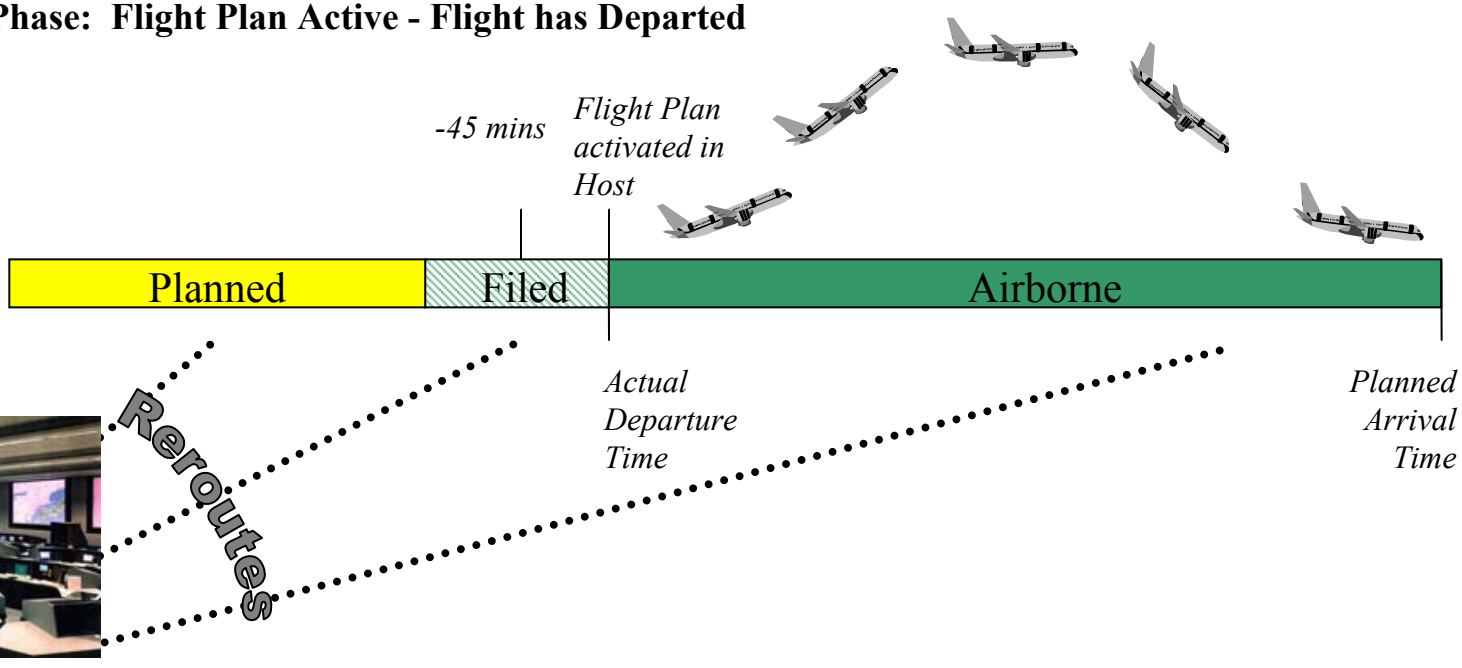
© 2003 The MITRE Corporation. All Rights Reserved.

The Broader Reroute Picture:
The Life of a Flight Plan

Flight Planning Phase: Actual Flight Plan Not Yet Filed

Filed Phase: Flight Plan has been Filed

Airborne Phase: Flight Plan Active - Flight has Departed

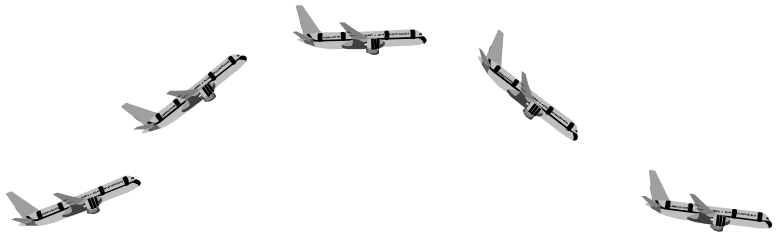


MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Related Efforts



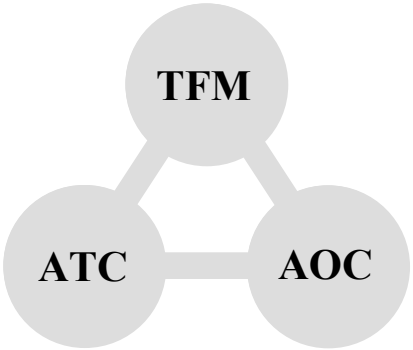
Planned	Filed	Airborne
 – **RAT** – **FCA Rerouting Capability**	**-TFM-M**	LOCKHEED MARTIN **Automated Assisted Dynamic Rerouting (AADR)** – **Automate delivery of applicable TFM reroutes on URET CCLD**
Status	• RAT List available in ETMS 7.6 • Users receive electronic flight lists • Use of FPPP being explored	• RAT List available in ETMS 7.6 • TFM receives electronic flight lists • Concepts for TMU integration being explored • Initial TFM-M requirements defined	• URET build 6 (2006) to include AADR • ERAM Requirements defined

MITRE

CAASD

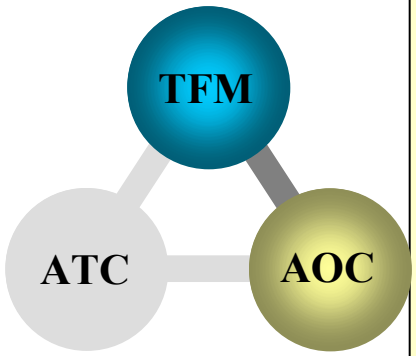
© 2003 The MITRE Corporation. All Rights Reserved.

Evolution of Rerouting Capabilities



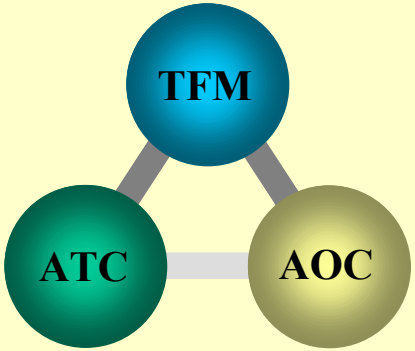
General Advisories

Flight-Specific Manual Rerouting



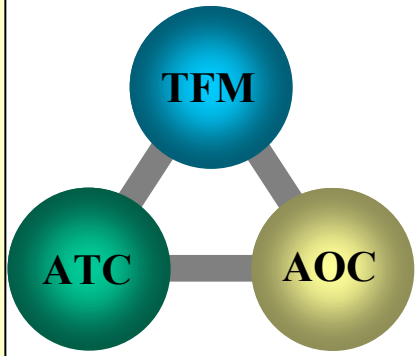
Flight-Specific Reroute Lists

Flight-Specific Automated Rerouting



Flight-Specific Lists Integrated with User/ATM Automation

TFM/ATC Integration



TFM-M and ERAM Enhancements

You are Here

MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

F045-B03-044

Reroute Implementation by Phase of Flight

-45 mins

Flight Plan activated in Host

Flight Planning Phase | **Filed Phase** | **Airborne Phase**

Actual Departure Time

Planned Arrival Time

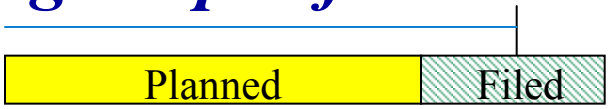
Dispatcher

Traffic Management Coordinator

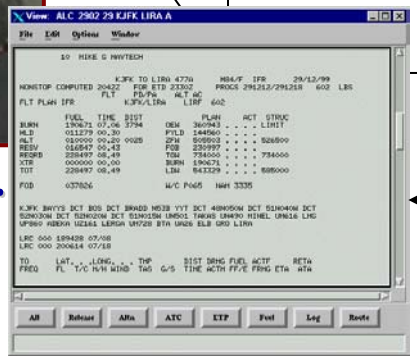
Controller

© 2003 The MITRE Corporation. All Rights Reserved.

Dispatcher Receives Flight-Specific Reroutes and Replans Flight



Dispatcher



Reroutes can be integrated into flight planning system

ATCSCC ADVZY 027 DCC 10/24/02 J6 REROUTE ADVISORY 1145Z

IMPACTED AREA: ZID
REASON: THUNDERSTORMS
INCLUDE TRAFFIC: TRAFFIC ON J6 OVER BWG CAN EXPECT REROUTE OVER BNA
VALID TIMES: 241200 - 241700
FACILITIES INCLUDED: ZOB/ZAU/ZNY
PROBABILITY OF EXTENSION:
ASSIGNED REROUTE:

****

AIRLINE AAL

ACID TYPE DCENTR ACENTR ORIG DEST ETD ETA PGTD IGTD IGTA

AAL1035 MD80 ZNY ZFW JFK DFW P1609 E1642 1552 171552 171644
REROUTE: DRCT..BNA.LIT.BYP4.DFW

AAL1373 MD80 ZNY ZFW PHL DFW P1630 E1713 1609 171609 171715
REROUTE: DRCT..HVQ.J6.RYANS..BNA..LIT.BYP4.DFW

AAL15 MD80 ZNY ZFW EWR DFW P1638 E1732 1639 171639 171736
REROUTE: PARKE.J6.RYANS.BNA.LIT.BYP4.DFW

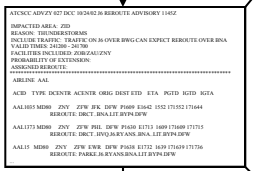
MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

TMC Receives Flight-Specific Reroutes and Enters Amendments

Filed



ATCSCC ADVZY 027 DCC 10/24/02 J6 REROUTE ADVISORY 1145Z

IMPACTED AREA: ZID
REASON: THUNDERSTORMS
INCLUDE TRAFFIC: TRAFFIC ON J6 OVER BWG CAN EXPECT REROUTE OVER BNA
VALID TIMES: 241200 - 241700
FACILITIES INCLUDED: ZOB/ZAU/ZNY
PROBABILITY OF EXTENSION:
ASSIGNED REROUTE:

****

ACID TYPE DCENTR ACENTR ORIG DEST ETD ETA PGTD IGTD IGTA

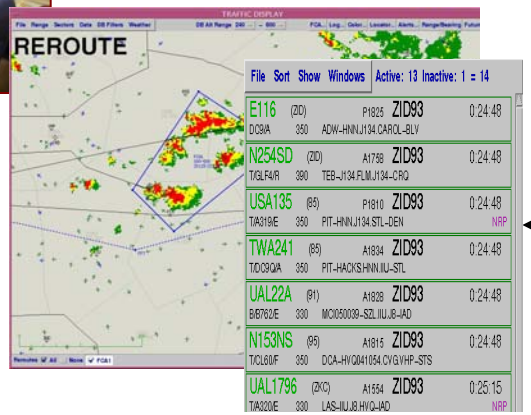
AAL1011 MD80 ZNY ZFW JFK DFW P1609 E1642 1552 171552 171644
REROUTE: DRCT..BNA.LIT.BYP4.DFW

USA1373 MD80 ZNY ZFW PHL DFW P1630 E1713 1609 171609 171715
REROUTE: DRCT..HVQ.J6.RYANS..BNA..LIT.BYP4.DFW

UAL15 B737 ZNY ZFW EWR DFW P1638 E1732 1639 171639 171736
REROUTE: PARKE.J6.RYANS.BNA.LIT.BYP4.DFW

...

TMC



Reroutes can be integrated into TFM Automation system as flight plan amendments

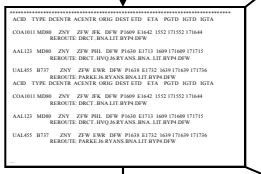
MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Controller Receives Flight-Specific Reroutes and Enters Amendments

Airborne



Sector Controller

```
**********************************************************************
 ACID   TYPE  DCENTR  ACENTR  ORIG  DEST ETD   ETA   PGTD   IGTD   IGTA

 COA1011 MD80    ZNY    ZFW  JFK   DFW  P1609  E1642  1552 171552 171644
                 REROUTE: DRCT..BNA.LIT.BYP4.DFW

 AAL123   MD80    ZNY    ZFW  PHL   DFW  P1630  E1713  1609 171609 171715
                 REROUTE: DRCT..HVQ.J6.RYANS..BNA..LIT.BYP4.DFW
```

Reroutes will be integrated into URET as trial plans

MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Reroute Implementation by Phase of Flight

-45 min

Flight Plan activated in Host

Flight Planning Phase | **Filed Phase** | **Filed** | **Airborne Phase**

Actual Departure Time

Planned Arrival Time

Dispatcher

Traffic Management Coordinator

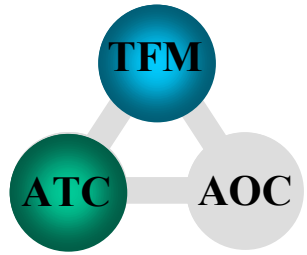
Controller

MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Filed Phase Option 1: TMC Amends Flight Plans



General Route Advisory and New Departure Strips

Clearance Delivery

Clearances

Tower Controller

TRACON Controller

En Route Sector Controller

Flight Crew

Flight Plan Amendment via:

(1) **Existing Keyboard Entry *or***

(2) **ETMS/TFM-M Amendment Capability *or***

(3) **URET *or***

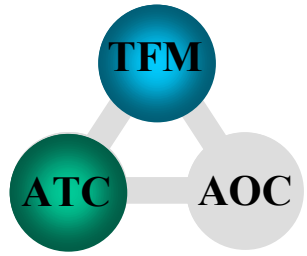
(4) **Automatically by Host/ERAM**

MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Filed Phase Option 2: TMC Delegates Amendments



TMC delegates entry of flight plan amendments

General Route Advisory and Flight-Specific Routes

Manual Flight Plan Entry and Clearance Delivery

Tower Controller
via keyboard entry

TRACON Controller
via keyboard entry

En Route Sector Controller
via URET

Clearances

Flight Crew

MITRE

CAASD

© 2003 The MITRE Corporation. All Rights Reserved.

Summary of Concept for "Filed" Phase

- **Flight plan amendment responsibility**
  - **Before flight strip print time or 45 minutes before departure – dispatchers**
    - **Accommodate reroute by re-filing flight plan**
    - **Cancel flight or request exemption**
  - **After flight strip print time – Air Traffic Management personnel**
    - **TMCs or departure controllers**
      - **Review electronic reroute messages and send them to Host as flight plan amendments, or**
      - **Manually locate affected aircraft and manually enter flight plan amendments**
    - **Departure controllers issue departure clearances**
- **Benefits of this approach**
  - **Manual entry of flight-specific reroutes significantly reduced through electronic message communication**
  - **Today's clearance-delivery process maintained**

© 2003 The MITRE Corporation. All Rights Reserved.

CAASD Concept Evaluation Plans

- **Discuss concept with operational personnel to address issues and questions**
- **Create lab capability for concept evaluation**
  - **Human-in-the-loop evaluations of enhanced TFM automation**

© 2003 The MITRE Corporation. All Rights Reserved.